3.4 - SHORELINE EROSION CONTROL

PURPOSE:

The purpose of this chapter is to provide regulatory and procedural guidance for reviewing proposed shoreline erosion control projects for consistency with the Regulations and ensuring that the water quality functions of the buffer are preserved or restored.

REGULATIONS:

§9VAC 10-20-130.5.a (4): "For shoreline erosion control projects, trees and woody vegetation may be removed, necessary control techniques employed, and appropriate vegetation established to protect or stabilize the shoreline in accordance with the best available technical advice and applicable permit conditions or requirements."

§9VAC 10-20-130.1.a: "A Water Quality Impact Assessment…shall be required for any proposed land disturbance [within a Resource Protection Area]."

§9VAC 10-20-130.1.b: "A new or expanded water-dependent facility may be allowed provided that the following criteria are met: (1) it does not conflict with the comprehensive plan; (2) it complies with the performance criteria set forth in §9VAC 10-20-120; (3) any non water-dependent component is located outside of Resource Protection Areas; and (4) access to the water-dependent

facility will be provided with the minimum disturbance necessary. Where practicable, a single point of access will be provided."

DISCUSSION:

Section 9VAC 10-20-130.5.a (4) of the Bay Act Regulations permits the removal of buffer vegetation to allow the installation of shoreline erosion control projects. However, a locality must verify that all aspects of the proposed erosion control project meet the requirements of the Regulations before allowing land disturbance or removal of vegetation within the Resource Protection Area (RPA). This should be done through the review of a Water Quality Impact Assessment (WQIA), concurrent with the local wetlands board review. It is extremely important that the local review be done as early in the process as possible to prevent the wetlands board from approving a project that is inconsistent with the local Bay Act program.

The Regulations require that localities review all shoreline erosion control projects that involve land disturbance in the RPA or removal of buffer vegetation. In reviewing shoreline erosion control projects, the local government must make a determination that:

- Any proposed shoreline erosion control measures are **necessary**
- The erosion control measures will employ the **best available technical advice**
- **Indigenous vegetation** will be **preserved** to the maximum extent practicable
- Proposed **land disturbance** will be **minimized**
- Appropriate **mitigation plantings** are proposed that will provide the required water quality functions of the buffer area
- The project is **consistent with** the locality's **comprehensive plan**
- **Access** to the project will be provided with the **minimum disturbance necessary**

- The project complies with **erosion and sediment control requirements**

If any of these criteria are not met, local governments should not allow removal of vegetation from the RPA buffer, regardless of whether or not wetland permits have been issued for construction of shoreline erosion control structures. In this case, the only recourse for property owners would be to request a formal exception to the local Bay Act program requirements. This would entail a public hearing and findings issued by a locally designated board or committee.

Another issue that has complicated the process is the misconception that shoreline erosion control projects are exempt from the Regulations and that localities are not required to review these types of projects. This has resulted in the loss of riparian buffers, unnecessary hardening of the shoreline, and destruction of RPA wetlands. The Regulations provide the local government with the authority to oversee shoreline erosion control projects to ensure that they are correctly approved, engineered, and constructed, and that all necessary mitigation measures are installed. If implemented correctly and consistently, the Bay Act Regulations should promote necessary shore erosion control measures while protecting the required water quality functions of the buffer.

The following sections provide guidance on how localities can determine if a project is consistent with the applicable sections of the Regulations.

Determining if the project is necessary

The Regulations allow the removal of buffer vegetation for shore erosion control devices only if the project is actually necessary. Even though the wetlands boards are charged with approving the type of erosion control structure allowed, the local government must confirm that the project is necessary before issuing any land disturbing permits or allowing any removal of vegetation. This requirement stems from language in the *Wetland Guidelines* manual prepared by the Virginia Institute of Marine Science (VIMS) and the Virginia Marine Resources Commission (VMRC) pursuant to

Active detrimental erosion was not observed on this site; therefore, an erosion control structure was not necessary and was not approved.

§28.2-1300 of the Code of Virginia (The Tidal Wetlands Act). This manual contains criteria for the evaluation of shoreline erosion control projects. Page 44 of the *Wetlands Guidelines* manual states that "shoreline protection structures are justified only if there is active, detrimental shoreline erosion which cannot be otherwise controlled" and that "needless shoreline modification is therefore discouraged". If a property were determined to have active, detrimental erosion, then it would seem appropriate to permit the landowner to remove buffer vegetation only as necessary for the installation of an erosion control measure. In determining if an erosion control measure is necessary, local government staff should work closely with the members of the local wetlands board, VIMS, and the Shoreline Erosion Advisory Service (SEAS).

If site visits and historical research do not indicate the presence of active, detrimental erosion, the local government should not permit the removal of buffer vegetation or land disturbance within the buffer. In these situations, the landowner should be encouraged to use non-structural methods of shoreline protection such as establishing a marsh fringe and/or planting native shrubs and tall grasses in the riparian buffer area.

Best available technical advice

In order to be consistent with the Regulations, a shoreline erosion control measure must be based on the "best available technical advice." The applicant should seek the advice of a shoreline engineer or some other erosion control specialist such as staff from the SEAS program at the Department of Conservation and Recreation (DCR). While there is no one source for this information, the local government must ensure that the applicant has selected the erosion control method that is consistent with the nature and severity of the erosion problem on the site. For example, if the applicant applies for approval to construct a seawall, but, as the State's technical experts in the review of tidal wetland and shoreline erosion control permit applications, SEAS and VIMS were both to recommend that a stone revetment is an appropriate remedy, the locality should give serious consideration to such recommendations

prior to determining whether or not to approve the application.

For guidance on selecting the proper method of shore erosion control based on site conditions, local governments and wetlands boards should use the various VIMS publications on shoreline erosion control BMPs. One very useful source of information, which is based on research provided by VIMS, is the Hampton Roads Planning District Commission's *Regional Shoreline Element of Comprehensive Plans*. This document provides information on how to select the most appropriate shoreline erosion control alternative based on the wave climates and erosion rate. This ranking system is also supported by the results of several

Note: Alternative #1 is the preferred control method with subsequent methods being listed in descending order of preference.

Areas with Low Erosion Rate (< 1 ft/yr.)
(low energy shorelines with an average fetch exposure of <1 nautical mile)

1. Vegetative stabilization with/or bank regrading
2. Revetment
3. Bulkhead

Areas with Moderate Erosion Rate (1- 3 ft/yr.)
(medium energy shorelines with an average fetch exposure of 1-5 nautical miles)

1. Vegetative stabilization with/or bank grading
2. Beach nourishment
3. Revetment
4. Breakwaters
5. Groins
6. Bulkheads

Areas with Severe Erosion Rate (> 3 ft/yr.)
(high energy shorelines with an average fetch exposure of > 5 nautical miles)

1. Relocation (of threatened structures)
2. Beach Nourishment
3. Revetments
4. Breakwaters
5. Groins
6. Seawall

VIMS studies and guidance documents.

Before selecting or approving an erosion control alternative, it is suggested that a "reach assessment" be performed by the applicant or his/her agent. This should be done based on the information provided in the VIM's publication entitled *Shoreline Erosion Guidance for Chesapeake Bay Virginia* by Scott Hardaway. Section IV of this document provides details on how to perform the technical assessment of a reach.

A REACH ASSESSMENT INCLUDES, AMONG OTHER ELEMENTS:

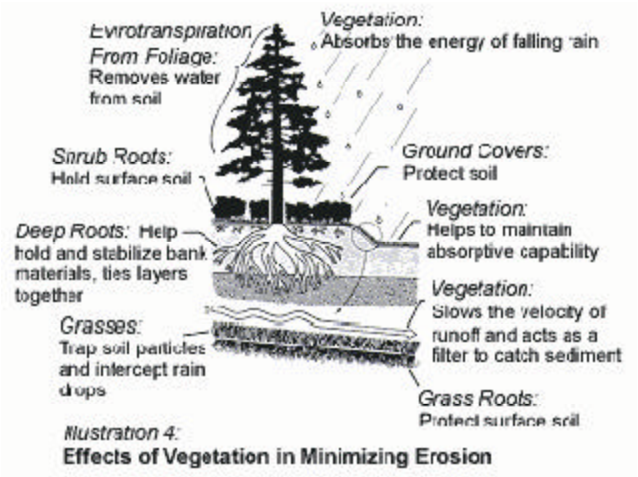
1. Determining the limits of the reach the project lies in
2. Determining the historical rates and patterns of erosion and accretion
3. Determining the source and volume of the sand supply
4. Determining the effective wave climate, direction of littoral drift, and estimating the potential impacts of the project on adjacent properties
5. Estimation of other erosion causing factors (groundwater discharge, surface runoff, etc.)

At the very least, the locality should require that the applicant provide this basic assessment so that the local Bay Act program coordinator and the wetlands board members will have an accurate evaluation of the erosive conditions of the site. The results of the reach assessment and the best available technical advice should be included in the required WQIA for review. This information will assist the decision makers in determining which control method is most appropriate to the severity of the erosion problem on the site.

Preserving indigenous vegetation

In order to protect the integrity and water quality functions of the riparian buffer, it is essential to preserve existing vegetation within the RPA. That is the reason for inclusion of the preservation of vegetation as one of the General Performance Criteria listed in

the Regulations (§9VAC 10-20-120.2). In reviewing shoreline erosion control projects, the locality must confirm that the applicant has made a reasonable effort to avoid and minimize the removal or disturbance of woody vegetation associated with the access and installation of the erosion control measure. **It is much easier and cheaper to preserve buffer vegetation than it is to remove vegetation and replace it with new woody vegetation.** The



Graphic reprinted from Manashe, Elliott. 1993. *Vegetation Management: A Guide For Puget Sound Bluff Property Owners*. Shorelands and Coastal Zone Management Program, Washington Department of Ecology, Olympia.

WQIA should include a site plan indicating the species type, size, and location of all woody vegetation on the site and what vegetation will be impacted or removed. The local government should review the plan to ensure that the project will not cause excessive disturbance or removal of buffer vegetation.

Often, landowners want to remove buffer vegetation as a method of preventing further erosion of the shoreline. As demonstrated in the following graphic, trees and other buffer vegetation actually contribute to the stability of the slope.

If the applicant is proposing to remove trees in the buffer as a preventative measure, the locality should ensure that tree removal is warranted. The removal of well-rooted, healthy, mature trees should be discouraged because this can actually decrease the stability of the slope and accelerate slope failure. Even if the stumps are left in the ground, the roots of the dead tree will decay over a three to nine year period.[1] As a result, eroding slopes may still fail after removing mature trees. **Therefore, only trees that are in immediate danger of falling over should be removed.**

The project in these photos would be considered in violation for excessive land disturbance and clearing of vegetation.

Minimizing land disturbance

The minimization of land disturbance is the first of the General Performance Criteria listed in §9VAC 10-20-120 of the Regulations. It is required for all developments in Chesapeake Bay Preservation Areas, including shoreline erosion control projects. The local Bay Act Coordinator should review the grading and access plan to verify the minimization of land disturbance. The images above are an example of excessive clearing during the installation of a bulkhead.

Requiring mitigation plantings

After the project is completed, the local government must ensure that appropriate vegetation is established to protect and stabilize the shoreline. As discussed in previous chapters of this manual, a buffer area that provides the best water quality functions is composed of several layers of vegetation, including canopy trees, understory trees, shrubs, and groundcover. Once the project is completed, the locality must require that the buffer be re-established (suggested vegetation replacement rates are located in the *Appendix D* in this manual). ***Replanting the buffer with a lawn grass is not acceptable.*** Turf grass does not provide the full range of buffer functions and the maintenance of the lawn may actually contribute to nutrient pollution of the adjacent water features. Rather

Re-establishment of the buffer as a managed lawn is not consistent with the intent of the Bay Act.

than a lawn, the landowner should replant a combination of native woody plants.

During the installation of devices such as revetments or bulkheads, it is common for the shoreline contractor to grade the slope and align the structure to achieve a 2:1 or 3:1 slope, per the accepted practice. An example of this can be seen in the picture below.

This practice often results in steep sloping terrain landward of the structure. While it may not be sensible to plant large canopy trees in the area adjacent to the structure, the Regulations require that this area be planted in vegetation other than a maintained lawn.

Steep slopes should have woody vegetation replanted.

Small trees, low-growing shrubbery, and native groundcovers are an excellent choice for planting in these sloped areas. The WQIA must include a planting and maintenance plan to ensure that the buffer vegetation will be established and that it will survive. No local permits should be approved without the submittal of an approved planting and maintenance plan. Some local governments have authority to require a performance guarantee to assure the establishment and survival of the required plantings. Please refer to the plant lists in Appendix A for examples of suitable vegetation for planting in riparian buffer areas.

Low growing juniper can be an effective woody groundcover.

Comprehensive plan consistency

Another requirement for shoreline erosion control projects is that they are consistent with the local comprehensive plan requirements. All Tidewater localities are required to have elements in their comprehensive plan that provide mapping of critically eroding areas and policies to address erosion control or shoreline management. Prior to approving erosion control projects, the locality must

determine if the proposal is consistent with all the goals, objectives, and strategies in the comprehensive plan. Some examples of comprehensive plan policies are regional shoreline erosion management, provisions for giving priority to vegetative erosion control methods, and retention or establishment of riparian buffers. The local WQIA review process must verify that the project is consistent with the comprehensive plan policies for shoreline erosion control.

Examples of Comprehensive Plan policies for shore erosion control

1. Regional shoreline erosion management measures
2. Giving priority to vegetative erosion control methods
3. Retention or establishment of riparian buffers

Minimizing disturbance for construction access

This requirement is very similar to the above requirement for minimization of land disturbance. The local government should review the project to ensure that access to the project site is provided with the least amount of land disturbance. Applicants must demonstrate that he/she has explored all reasonable options for access to the site. Where feasible, access to the project must be provided with a single construction entrance only. The WQIA should include a site plan that indicates the preferred method of access and the limits of clearing and grading.

Compliance with erosion and sediment control requirements

All land disturbances in CBPAs over 2,500 square feet, including shoreline erosion control projects, are required to comply with local erosion and sediment control regulations. During the 2003 General Assembly session, the Erosion and Sediment Control Law (Title 10.1, Chapter 5, Article 4 of the state code) was amended to remove the exemption for shoreline erosion control projects. This means that **all upland land disturbances associated with shoreline erosion control projects are no longer exempt from the E&S requirements.** Therefore, local governments must review projects that disturb more than 2,500 square feet for consistency with the local E&S laws.

CONCLUSIONS

- Shoreline erosion is a natural process and should only be controlled when there is potential threat to structures or a significant amount of annual property loss.

- All shoreline erosion control projects must submit a WQIA and receive approval of the local government prior to any removal of buffer vegetation.

- The locality must ensure that the WQIA addresses all of the requirements for consistency that have been discussed in this chapter.

- The local government should coordinate its review with the wetlands board in order to prevent the board from approving projects that are inconsistent with the local Bay Act program.

- Localities should designate a local staff person to attend the wetlands board meetings to ensure that all parties involved know the requirements of the Bay Act and the implications of inconsistency with the Regulations. This staff person should contact VMRC to ensure that he or she receives copies of all Joint Permit Applications (JPA) prior to the meeting of the wetlands board.

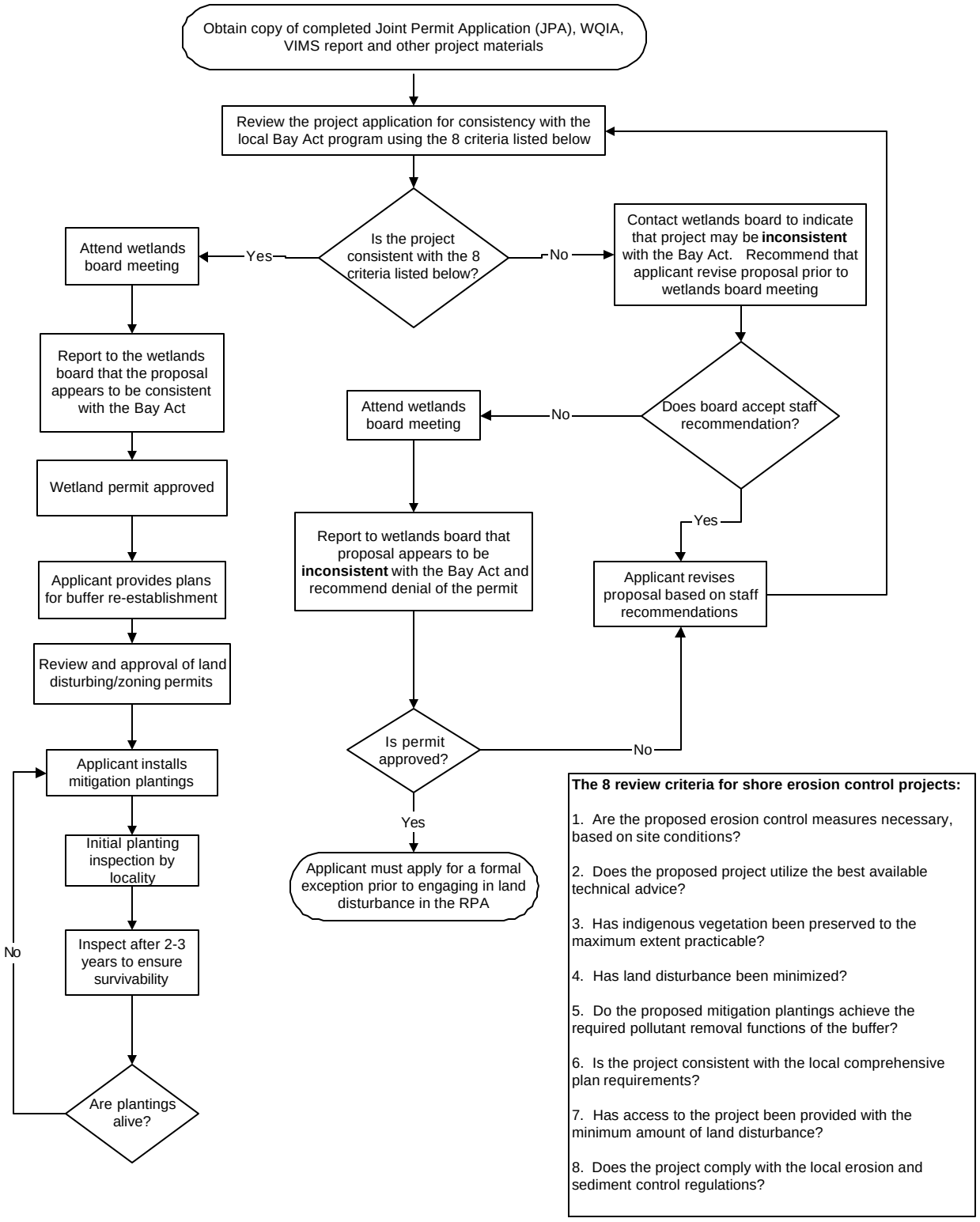
- **Approval of a wetlands disturbance permit does not constitute compliance with the local Bay Act regulations, nor does it require the locality to grant any land disturbing permits or allow the removal of any vegetation from the buffer.**

- The establishment of maintained lawns in the buffer is not permitted as mitigation for the disturbance of buffer vegetation caused by the installation of shore erosion control measures. The buffer must be established in native, woody vegetation as described in the buffer establishment guidelines in Appendix D.

- All shoreline erosion control projects disturbing more than 2500 square feet must comply with the local Erosion and Sediment Control regulations.

- Existing mature trees and other types of woody vegetation often provide significant erosion control benefits. Only trees that are in immediate danger of falling over should be removed.

Recommended local review and approval process for shoreline erosion control projects



[1]Manashe, Elliott. 1993. *Vegetation Management: A Guide For Puget Sound Bluff Property Owners.* Shorelands and Coastal Zone Management Program, Washington Department of Ecology, Olympia